Multiple sclerosis – symptoms, diagnostics, prognosis

(Stwardnienie rozsiane – objawy, diagnostyka, rokowanie)

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Abstract – The authors presented the symptoms of multiple sclerosis. They pointed out that the disease, which gives extensive damage to the myelin sheath around the protrusions of nerve cells, causes an impaired transmission of impulses along the nerve pathways in the brain and spinal cord at various levels, which can lead to a very different picture of the disease. The disease may develop acutely or subacutely. It is most often multiphase with periods of exacerbation and remission. Patients with multiple sclerosis are also subject to mental disorders. The progress of the disease also contributes to the increase in patient's disability. The authors also discussed the diagnostics of multiple sclerosis, stressing that its initiation in the early phase of the disease may affect the extension of the duration of the period, which is characterized by a reduced number of symptoms.

Key words **-** multiple sclerosis, symptoms, diagnosis, prognosis.

Streszczenie – Autorzy przedstawili objawy stwardnienia rozsianego. Zwrócili uwagę, że choroba dając wielomiejscowe uszkodzenia otoczki mielinowej wokół wypustek komórek nerwowych, powoduje na różnych poziomach upośledzenie prawidłowego przekazywania impulsów wzdłuż dróg nerwowych w mózgowiu i rdzeniu kręgowym, co w konsekwencji może prowadzić do bardzo zróżnicowanego obrazu choroby. Choroba może rozwijać się ostro lub podostro. Najczęściej ma charakter wielofazowy z okresami zaostrzeń i remisji. Chorzy ze stwardnieniem rozsianym podlegają także zaburzeniom psychicznym. Postęp choroby przyczynia się również do narastania niepełnosprawności chorego. Autorzy omówili ponadto diagnostykę stwardnienia rozsianego, podkreślając, że rozpoczęcie jej we wczesnej fazie choroby może wpłynąć na wydłużenie trwania okresu, który charakteryzuje się zmniejszoną liczbą objawów.

Słowa kluczowe **-** stwardnienie rozsiane, objawy, diagnostyka, rokowanie.

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Authors' contributions to the article:

A. The idea and the planning of the study
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Accepted for publication: November 30, 2018.

I. SYMPTOMS

The Latin name sklerosis multiplex means that the disease process occurs in many (multiplex) sites of the nervous system [1]. In places of myelin damage, scars or indurations are formed. This is a disease related to nerve cells (neurons), glial cells (oligodendrocytes), brain immune cells (microglia) in which the myelin sheath around the nerve cell protrusions is damaged, which impairs proper transmission of impulses along the nerve

pathways in the brain and spinal cord. A demyelination process is created with simultaneous or secondary decay of axial and secondary fibers. This leads to the formation of demyelination centers called plaques. The term 'multiple' reflects the scattering of the pathological process over various parts of the nervous system as well as the interval of changes over time. [1-6]

In most cases, multiple sclerosis begins with an acute episode of neurological symptoms – called an isolated syndrome, followed by a phase with periods of improvement and worsening. MS can cause numerous symptoms [7]. The term of the isolated CIS syndrome is used to determine the first ever episode of neurological disorders suggesting CNS demyelination. The syndrome develops acutely or subacutely and reaches maximum intensity in the period of 2-3 weeks. Symptoms must last no less than 24 hours, without fever, infections and symptoms of encephalopathy. CIS is single-phase and usually monofocal. Typical clinical symptoms of CIS include: core syndrome, retrobulbar optic neuritis, cerebral or cerebellar brain damage syndrome and hemispheric syndrome. Retrobulbar neuritis usually involves only one optic nerve. The involvement of both nerves allows to exclude MS and indicates a different pathology. Symptoms of inflammation develop within a few hours, disappear after about 2 months. The degree of withdrawal of inflammation symptoms depends on the size of the changes caused. The core syndrome in CIS is understood as incomplete transverse myelitis. The most common symptom is sensory disturbance, patients complain of tingling and numbness in the limbs. It can be said that these symptoms usually start in one place and move up, down and to the opposite side. The symptoms of the stem syndrome include cerebellar ataxia and nystagmus, while the symptom accompanying the damage of the trunk is double vision. [1,8,9]

The disease manifests itself in a different way for different people. For some, it occurs in the form of repetitive relapses to a lesser or greater extent. The course of the disease is difficult to determine at the beginning of the disease. Some may have one or two attacks, after which the disease may be asymptomatic or with mild symptoms throughout life. Unfortunately, in many cases sooner or later the disease will manifest itself in the form of repetitive and increasing relapses. The disease is most often multiphasic and the course is accompanied by periods of exacerbation and remission, which is why the disease is referred to as a remission disease [1,10]. Depending on the place of the process destroying myelin, various symptoms appear. Multiple sclerosis affects the occurrence of many symptoms. They can be unexpected and sudden, or develop gradually and slowly [11]. The most common symptoms are movement disorders, muscle weakness and muscle spasms. Post-traumatic motion disorders are characterized by paresis or more frequent spastic paralysis occurring in more than half of the patients. Spastic paralysis is the result of damage to the upper motor neuron and is manifested by an increase in muscle tension and an increased response to stretching. Spasticity in MS assumes different patterns, depending on the location and number of demyelination lesions. The most common form of paralysis is spasticity associated with the flexion or extension of the knee joint of a significant degree and increased tension of the muscles that bring the hip joint, and sometimes an excessive extension in the ankle joints in the form of clubfoot. In the case of multiple sclerosis a characteristic symptom of a penknife appears, which is characterized by a growing tension during the stretching of the muscle. Spasticity significantly impairs the patient's life, causes pain and limits the ability to perform everyday movement. The person walks on a wide support, and in the later period of the disease a systolic-atactic gait is evident. Patients often struggle with mobility, coordination and balance.

In addition, the disease is accompanied by visual disturbances that may be manifested by ophthalmological inflammation of the cranial nerve II or a problem with eye movement. Retrobulbar optic neuritis is usually the first symptom of multiple sclerosis. Inflammation is manifested by inadequate visual acuity, which in turn can lead to blindness. Long-term tiredness is also an inherent symptom. There may occur nystagmus, scanning speech, dysmetria, as well as intricate tremor with injuries to the cerebellum. Tremor occurs during any movement and increases at the end of movement. The manifestation of MS are also problems with swallowing called dysphagia. Cognitive disorders of various degrees and symptoms of depression are also frequent. It is not uncommon for sphincter disorders such as urinary incontinence, urgency, urinary retention and constipation. More than a half of people can notice overactive bladder detrusor muscle. This contributes to urinary incontinence leading to disturbed micturition. Bladder infection may develop as a result of its improper functioning. If the patient's condition deteriorates, progressive impairment of the lower urinary tract occurs. Faecal incontinence is much less common, and such disorder is more likely to occur in a form of constipation. In addition, people who are ill often have sexual problems that occur for men in the form of impotence, and for women, there is frigidity and menstrual disorders. A well-known symptom is the feeling of 'current' running along the spine, the Lhermitte symptom, although it is not a pathognomonic symptom for MS.

After the head flexion, the patient feels a current that goes along the spine or from the neck towards the upper and lower limbs. Neuropathic pain is the most common type of pain in MS that causes suffering. It is described as permanent, troublesome, stinging or as an intense tingling. It most often occurs in the lower limbs. [1,5,7,10-13]

The disease also includes sensory disorders, which include hypoesthesia, hypersensitivity and paraesthesia. Paresthesia occurs in a form of tingling, scalding, burning pain and a feeling of pressure on the surface of the skin with increased sensitivity. Pain associated with paresthesia can be crushing, stinging, pulsing and tightening. Sometimes patients have the inability to recognize objects by means of gripping them while maintaining the sense of touch, movement and position. Patients often complain of acute pain in the limbs and in torso area. In addition to severe pains, there are paroxysmal tonic spasms in the limbs. Cognitive dysfunction occurs in nearly half of the affected patients. Problems with attention, memory, pace of information processing and visuospatial perception are visible. Some people suffer from mental disorders during the illness. Patients suffer from emotional disorders, they can quickly transition from depression to euphoria, which sometimes is inappropriate for a given situation. Dementia, hysterical states, and sometimes hypochondrial states are also noted [1,3,5,12].

Multiple sclerosis is a well-known and widespread disease that contributes significantly to disability. It is characterized by the changing nature of the course and difficulty in making further diagnosis [1]. The first direct meeting of a person with multiple sclerosis takes place before the final diagnosis at the time of the suspicion of the disease. The difficult period in the life of the patient and his family begins when the first disturbing symptoms appear. The variety of these symptoms and the severity of MS affect the quality of life in its various areas [2.5]. The quality of life is closely related to the health of the patient and his physical, mental and social status. Patients with multiple sclerosis every day have to deal with numerous problems related to the movement, but also to the mental and social sphere, which has a significant impact on their quality of life. There is no doubt that MS belongs to diseases that have a negative impact on human existence, causing, above all, a limitation of individual physical and social activity. Tiredness is a common feature of people with multiple sclerosis. Tiredness does not come from exercise, but it is more related to exhaustion caused by small progresses, minor improvements after rest or a sense of general weakness [14]. Tiredness is an objective feeling of lack of energy to start any physical activity [15]. Tiredness can be primary or secondary. Uncertainty is one common feature of a difficult and unpredictable illness, which is why it is necessary to physically adapt a given person to the existing limitations, but also the need to adapt in both emotional and social life [1,8,9,15].

II. DIAGNOSTICS

In order to implement the treatment of multiple sclerosis as quickly as possible, the patient should be accurately and quickly diagnosed. Early diagnosis may affect the prolongation of the period which is characterized by a reduced number of symptoms. Currently, there is no specific diagnostic test that would 100% indicate multiple sclerosis [1]. In order to diagnose symptoms, a basic examination is carried out, which includes the interview and neurological examination, as well as additional tests. Biochemical tests are also important, those include blood counts, ESR, urinalysis, liver and kidney functioning, the presence of antinuclear antibodies.

The doctor who diagnoses a patient is supported tests such as magnetic resonance and cerebrospinal fluid examination, which are helpful in diagnosing multiple sclerosis. There is no generally available and existing set of tests to be performed for patients with a suspicion of MS. The doctor decides about the right choice, guided by the symptoms and complaints of the patient. Laboratory tests are carried out in order to exclude the possibility of other diseases whose clinical picture resembles MS [1,3,12,16,17]

A very sensitive and basic diagnostic method is magnetic resonance imaging [1]. The majority of patients with clinically defined MS have visible changes in the brain MR [18-23].

In the process of determining the final diagnosis, an important examination is also magnetic resonance of the spinal cord. It is a necessary examination in the case of primary progressive MS and in the presence of spinal symptoms. In addition to the progressively occurring focal lesions, one of the important features of the magnetic resonance imaging is brain and spinal atrophy. It occurs regardless of the stage and clinical form. Magnetic resonance imaging is not only a diagnosis, it is also helpful when monitoring and controlling the progressions of the disease.[18-23]. The examination of cerebrospinal fluid is also useful in diagnosis. This test is appropriate in uncertain situations, for example for patients with atypical or only subjective clinical symptoms or with the coexistence of other autoimmune diseases. [13,24] Although medicine has more and more modern diagnostic methods, there are still difficulties in establishing diagnosis of MS [1].

III. PROGNOSIS

Prognosis of the disease and its clinical activity is based mainly on the assessment of clinical parameters and magnetic resonance imaging. The course of multiple sclerosis is variable and difficult to predict [1]. It is believed that women have better prognosis than men, especially if the disease started after the age of 40. Life expectancy is not much shorter than among the general population. The main problem, therefore, is not quicker mortality, but problems that a person encounters during their life, such as its reduced quality and progressive disability [10]. Negative prognostic factors include: a large conversion factor of relapses in the period of first 5 years of disease duration, uncertain withdrawal of emerging symptoms after the first relapses, a short time between the first and second relapse and progressive disability along with cognitive impairment at the beginning of the disease. Progressing limited physical fitness leads to limitations in the distance of walking, and after a longer period to the need to use one-sided support [1,2,10]. Factors that have a positive impact on the prognosis of multiple sclerosis are: young age of diagnosis, the initial appearance of sensory symptoms or optic neuritis, rapid withdrawal of symptoms after the relapses and mild development during the first five years. [25-27]

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